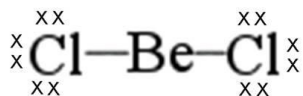


Summary of Level 2 Shapes of molecules

Linear

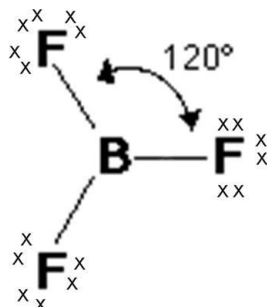
- 2 regions of electron density around the central atom, which is beryllium
- 2 bonding pairs of electrons around the central atom
- there are no lone pairs of electrons around the central atom
- the regions of electron density are arranged as far as possible from each other, in order to minimise repulsion, making a **LINEAR** shape
- bond angle is **180°**
- eg's H_2 , HCl , CO_2 , HI , O_2 , CS_2 , N_2 , C_2H_2



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Trigonal planar

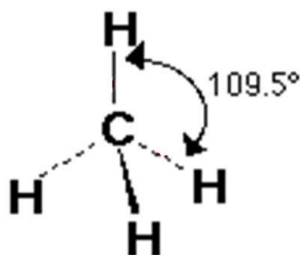
- 3 regions of electron density around the central atom, which is boron
- 3 bonding pairs of electrons, around the central atom
- there are no lone pairs of electrons, around the central atom
- the regions of electron density are arranged as far as possible from each other, in order to minimise repulsion, making a **TRIGONAL PLANAR** shape
- With a bond angle is **120°**
- eg's BCl_2Br , $BClBr_2$, C_2H_4 , H_2CO , $COCl_2$, SO_3



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Tetrahedral

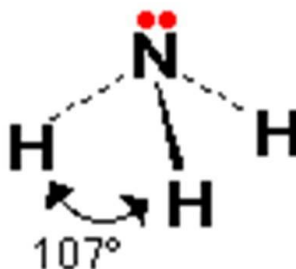
- 4 regions of electron density around the central atom, which is carbon
- 4 bonding pairs of electrons around the central atom
- there are no lone pairs of electrons around the central atom
- the regions of electron density are arranged as far as possible from each other, in order to minimise repulsion, making a **TETRAHEDRAL** shape
- With a bond angle of **109°**
- egs SiH_4 , CH_2Br_2 , CCl_3H , $SiCl_4$, CF_4 , CH_3Br



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Trigonal pyramidal

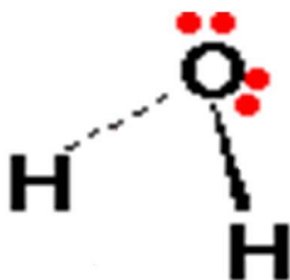
- 4 regions of electron density around the central atom, which is nitrogen
- 3 bonding pairs of electrons around the central atom
- there is 1 lone pair of electrons around the central atom
- the bond angle of **107°**
(the lone pair of electrons takes up space as if they were a bond, so the arrangement is tetrahedral but because lone pairs repel more than bonding pairs, the bond angle is less than the expected angle of 109°)
- TRIGONAL PYRAMIDAL** shape
- eg's NF_3 , PCl_3 , AsH_3 , Ni_3 , AsF_3 , PF_3 ,



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V-shaped

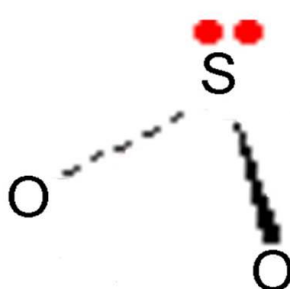
- 4 regions of electron density around the central atom, which is oxygen
- 2 bonding pairs of electrons around the central atom
- there are 2 lone pairs of electrons around the central atom
- the bond angle of **less than 109.5°**
(the two lone pairs of electrons take up space as if they were a bond, so the arrangement is tetrahedral but because lone pairs repel more than bonding pairs, the bond angle is less than the expected angle of 109.5°)
- V-SHAPE or BENT**
- eg's H_2O , OF_2 , SCl_2 , H_2S , SF_2 , $NOCl$



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V-shaped

- 3 regions of electron density around the central atom, which is sulfur
- 2 bonding pairs of electrons around the central atom
- there is 1 lone pair of electrons around the central atom
- the bond angle of **less than 120°**
(the lone pair of electrons take up space as if they were a bond, so the arrangement is trigonal planar but because lone pairs repel more than bonding pairs, the bond angle is less than the expected angle of 120°)
- V-SHAPE or BENT**
- eg's SO_2 , O_3 , GeF_2



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